

Living with Elephants

While mainstream headlines continue to be dominated by the impact of the ivory trade on Africa's elephants, an NGO in a remote corner of Botswana is working to solve a very different conflict between elephants and humans

by James Gifford



Collaring missions are also an opportunity to take blood samples and record vital statistics which help determine the general health of the elephant

A head peers cautiously through the narrow, door-less void, fighting the swirling wind as it gazes at the target far below. The elevation and perspective have transformed Africa's largest land mammal into a small, vulnerable-looking creature – a grey, amorphous shape slowly growing and regaining its form as the helicopter manoeuvres into position. Inside, the sharp cock of a rifle pierces the monotonous drone – the signal for Dr Anna Songhurst to grasp the stopwatch hanging round her neck. Her thumb hovers over the button, poised to start the clock. Every second counts when it comes to collaring elephants.

'It takes seven minutes for an elephant to go down,' Songhurst explains later, as we sit by a campfire in the remote Panhandle of the Okavango Delta in northwest Botswana. 'We try to keep it in the open but after five minutes, the drug starts to take effect and the elephant stops responding to the helicopter.'

The data from the GPS collars help to map the elephants migratory routes but the risks to this conservation measure are significant: 'If it ends up on its haunches and falls sternum first, it can crush its lungs and suffocate; if it falls against a tree, a branch can block its airway; and if it is near water it can

drown. The last two minutes are really nerve-racking,' she adds needlessly – an understatement that belies her obvious love and empathy for her chosen subject.

Songhurst has been studying elephants since 2004. Despite confessing she would have loved to have spent her PhD 'sitting in the bush,' focusing purely on elephant behaviour, she was drawn to the growing conflict between humans and elephants in the Okavango Panhandle. She spent three years there collecting elephant movement data (largely from counting footprints) and interviewing local farmers.

Having completed her doctorate in 2012, she returned to the remote Panhandle the following year to set up Ecoexist with her husband, Dr Graham McCulloch (a fellow wildlife researcher), and Dr Amanda Stronza, a US professor of anthropology.

Their goal was to address what Songhurst believes is the primary issue in conservation – human-wildlife conflict. In contrast with the continent as a whole, where elephant numbers have plummeted by 24 per cent or 144,000 in the decade prior to 2016, Botswana is faced with the opposite dilemma. The country's peaceful history, relative lack of poaching and huge swathes of wilderness have made it the region's safe haven, enticing approximately 130,000 elephants within its borders (according to Elephants Without Borders' 2016 Great Elephant Census). Other estimates by the Department of Wildlife and National Parks (DWNP) postulate the country's pachyderm population may even exceed 200,000.

Given the numbers, it's not surprising the country



Dr McCulloch and an Ecoexist field technician talk to a local farmer about mitigation techniques

is starting to attract ivory-traffickers despite the government's staunch commitment to anti-poaching. Accurate poaching data is hard to obtain – the DWNP reported 62 elephants were killed in 2017/18 compared with 42 the previous year, but this is likely to be a base minimum. Fortunately the scientists' efforts over the past decade have meant the vast majority of incidents occur outside of Ecoexist's domain.

Although 40 per cent of the country's 600,370 sq km has been assigned protected status in the form of national parks or private concessions, over 70 per cent of the elephants' range falls outside those areas. 'You can't expect the largest contiguous elephant population in the world to stay inside protected areas,' McCulloch explained. 'They have to be free-roaming and that is why Botswana is so unique.'

The opportunity cost to this freedom of movement is the ensuing interaction with humans. 'Conflict arises from competition for the same resources – water, vegetation and space,' summarises McCulloch and nowhere is this more apparent than in the Panhandle.

According to local villagers, as recently as the 1960s elephants were rarely seen here. Then, in 1996, an outbreak of bovine lung disease decimated the cattle population in Ngamiland (Botswana's northwest district). Although no direct causal link has been

proved, elephant numbers increased rapidly: by 2010, they had mushroomed to 10,000 and today around 18,000 elephants share 8,500 sq km with 16,000 people.

'The peak conflict period is between March and June when the natural pans dry out,' McCulloch elaborates. 'In order to reach the permanent water in the south, the elephants must run the village gauntlet, passing numerous, appetising, crop-filled fields on the way.' The consequential destruction of the farmers' produce can be catastrophic in an area with virtually no employment prospects – for many villagers subsistence farming is the only way to obtain food. Inevitably, retaliation is not uncommon. Legally elephants can be shot if they are caught 'in the act,' McCulloch tells me grimly, and on average 20 elephants are killed under this premise each year.

DATA ANALYSIS

It is not just crops that are at risk. The final obstacle facing the herds before they reach their oasis is a broad, dirt road – a (mostly pedestrian) thoroughfare that serves as the only access route for children walking several kilometres to school each day. 'We teach them the safe cross code,' says Boitshwarelo Mosenyegi, the *kgosi* or chief of the local village. 'In Gaborone (Botswana's capital) the children know about traffic, here they learn about elephants.'

Ecoexist has set up elephant behaviour workshops to help educate the villagers, but there has still been one fatality in each of the last three years. 'The circumstances are always different,' Songhurst explains, 'and, although hippos account for far more deaths, each incident stays fresh. It's just horrible...' Her voice abruptly falters illustrating how she has become emotionally invested in both sides of the conflict.

One element of the solution lies in the eight years of spatial data Songhurst has amassed from her PhD and the 40 elephants Ecoexist has collared. Since elephants habitually follow the same routes, the data has created a road map of their movements.

'We can compare seasonal variations to understand their decision-making process,' she reveals. 'When are they most likely to crop raid? Are they opportunistic or are there some habitual offenders? We can predict when an elephant is likely to be in a certain habitat at a certain time and how human features such as fields, veterinary fences or people affect their movements.' The implications from such an extensive data set are vast but one empirical conclusion stands out: if a field is less than one kilometre from an elephant pathway, then it is twice as likely to be raided by elephants.

Ecoexist showed the findings to the district land board, responsible for allocating plots to farmers and, after some persuasion, the department agreed not to allocate any more plots within these 'elephant corridors,' which range in width from two to 4.5km.

'It was an amazing feeling to put the research data into practice,' Songhurst beams. But she is not resting on her laurels. Ecoexist now manages and mentors seven PhD and three MA students, whose findings, it is hoped, will continue to inform government policy.

TRUSTED TECHNIQUES

For existing agricultural plots, a different approach was needed. McCulloch describes how they adopted various mitigation techniques, one of which involved using chillies – an idea borrowed from Loki Osborn, an elephant conservationist based in Zimbabwe. Osborn, whose McIlhenny ancestors invented Tabasco sauce, had discovered elephants dislike capsaicin, the ‘heat’ chemical in chillies. By hanging cloths soaked in a mixture of crushed chillies and engine oil on their fields’ perimeter fences, farmers could create a deterrent to the pachyderms.

‘Given our remote location and proximity to the Delta, the oil component was neither easy to acquire nor environmentally friendly,’ McCulloch continues. ‘So we adapted the method by mixing crushed chillies with elephant dung and water, then drying them in the sun to make briquettes.’ The farmers light these at night, which release the capsaicin odour as they smoulder.

The modified technique still requires a substantial investment in chillies – over 25kg for an average plot of 1-2ha – so Ecoexist set up community chilli plots, teaching villagers how to grow, nurture and protect them from a host of insect and avian thieves. ‘Malawian seeds are the hardest,’ he relates.

Like several Ecoexist initiatives, the idea snowballed. ‘When private farmers saw us buying chillies from the community cooperatives, they started growing chillies as well, so we put them in touch with a local sauce manufacturer. Now they supply it with their high-grade produce and the farmers get the lower-grade chillies, effectively creating a new cash crop.’

Other mitigation techniques are less subtle. ‘This is the ultimate elephant deterrent... but expensive,’ McCulloch points to an electric fence enclosing a vast, cleared expanse just a few metres from a well-trodden elephant pathway. A second, exterior fence daubed with black, chilli oil cloths creates an association between chillies and an electric shock should the elephants break through the first line of defence.

Other measures have been equally successful, according to Lenkokame Tlale, vice secretary of the Elephant-Aware Farmers Group. ‘Before Ecoexist, there was more conflict with elephants. Every time we saw an elephant we would shout and beat drums unnecessarily [to scare it away]. Ecoexist taught us to observe and interpret the behaviour,’ she elaborates.

‘They have also introduced us to new farming techniques, which has changed the way I grow my crops,’ Tlale continues in a reference to climate-smart or conservation agriculture (CA). McCulloch outlines the theory behind CA: ploughing oxidises the nutrients, which escape into the atmosphere, leading to a reduction in fertility and soil erosion. Instead of disturbing the topsoil, CA farmers cover the earth with mulch and adopt a policy of crop rotation, alternating nitrogen-fixing crops such as pulses (beans, groundnuts and cowpeas) with conventional grains. ‘We are trying to phase out maize altogether,’ he adds. ‘Not only is its success highly susceptible to changes in rainfall, it is also like candy-floss for elephants!’



Crops such as millet need to be pounded into grain before they can be stored or sold

‘The new approach has increased yields by up to ten times,’ McCulloch asserts, ‘enabling farmers to have smaller plots, which are cheaper to fence and easier to protect.’ In addition, it obviates the need to frequently relocate fields – a necessity of traditional farming methods due to the poor Kalahari soil – which frees up more space for elephants.

‘Historically, the government has subsidised subsistence farmers to make rural communities less reliant upon state-financed drought relief,’ McCulloch continues. ‘We hope to get these resources reallocated into CA, which should accelerate the adoption of the new techniques.’

ELEPHANT ECONOMIES

Not all farmers are keen to change. ‘Some say it is too labour intensive,’ Tlale acknowledges, ‘and they are not educated, which makes them harder to convince.’ Those that don’t adapt miss out on Ecoexist’s support in the form of physical equipment and technical knowledge, as well as all-important access to the ‘elephant-friendly’ produce markets that Ecoexist has generated. Their crops are also more vulnerable in sub-optimum growing conditions. ‘But now we are producing more, so we can sell the extra crops. Other farmers will switch when they see the benefits,’ Tlale predicts.

The focus on benefits has become a pivotal aspect of the Ecoexist project. ‘During my PhD, it became apparent that people here see no value in elephants,’ Songhurst recalls. It is an imbalance they have tried hard to rectify. Ecoexist now employs a total of 31 staff,



Unlike much of the continent, Botswana’s elephant population numbers are on the rise

‘I tell people not to shoot elephants as they bring value to our country’

The use of chillies as an elephant deterrent has helped spawn the growth of a new cash crop



which equates to a BWP 74,000 (£5,430) cash injection into the local economy per month in salaries alone.

It also offers grants, scholarships and fellowships, but equally as important is the positive message local Ecoexist employees spread about elephants throughout the rest of the community: ‘Converts often become our biggest advocates,’ states Songhurst.

Namo Mokgosi, an Ecoexist community officer, acting as liaison between the farmers and the researchers, is a prime example. ‘I tell people not to shoot elephants as they bring value to our country,’ she affirms. ‘Things have changed,’ she adds. ‘Because of the mitigation techniques, shooting is now a last resort instead of the first thing farmers do.’

Ecoexist’s staff training has also had a significant impact according to Kenneth Mangetse, a field technician. ‘They have taught us about computers and email, and how to speak to clients,’ he announces, before revealing his long-term ambition to use his new expertise to supply the community with vegetables.

Upskilling the predominantly uneducated local

population enables the NGO to function in McCulloch and Songhurst’s absence, but the scientists are aware that a long-term solution needs to be self-sustainable, not dependent upon the charity’s finite resources.

To this end they are trying to build an ‘elephant economy’ – a range of income-generating goods and services that stem from elephants – which will ensure the local community ascribe a value to the pachyderms. These range from drawings and sculptures, sold in safari lodges in neighbouring concessions, to specialised tourism activities, such as a sleep-out deck overlooking an elephant corridor.

Ecoexist has also created ‘elephant-friendly’ peanut butter and popcorn, manufactured with CA-grown ingredients, but so far demand has been limited for such niche items. They hope their next product – elephant-friendly beer – will have greater appeal among the 100+ safari lodges operating in northern Botswana. The venture requires them to set up a microbrewery from scratch, but the scientists are typically undaunted by the scale of the challenge.

Despite targeting one of the key hotspot areas for elephant-human conflict in Botswana, the project’s budget limitations have restricted its physical domain, which remains small relative to the size of the country. However, its influence has penetrated nationwide. By informing and working with both government and private institutions, the lessons Ecoexist has learnt about sustainable strategies are now informing policies and farming practices across Botswana. More recently, the organisation’s involvement with the Kavango Zambezi Transfrontier Conservation Area (comprising Angola, Botswana, Namibia, Zambia and Zimbabwe), has seen its sphere of influence extend even further.

From relationship-building and education to agricultural practices and commerce, Ecoexist’s multifarious strands are reminiscent of the workings of a small country rather than a research project, but the scientists believe their holistic approach is integral to their success. ‘If you really want to save wildlife, you have to better the lives of the people who live with the animals,’ McCulloch concludes.

Some Batswana are already convinced. In a reference to the country’s historic mineral wealth, Kgosi Mosenyegi astutely predicted, ‘Elephants could be Botswana’s diamond of the future.’ ●